affordable GPS rrr:1 Articles 18/5/09 10:52 Page 34

Affordable GPS for all

Left: the poor man's moving map display, presented on a £60 Navigo V2

Above: the Navigo installed in Richard's aircraft – simple but effective

Below: the Mio 550 is probably one of the best PDA/GPS combinations

***Richard Warriner** explains how he's put inexpensive road-going technology into the cockpit*

GPS navigation has been around for a while. It's a very useful tool, but the aeronautical variety suffers from a consistent problem, namely cost. The latest incarnation has moved a significant step forward in resolving this problem. Everyone will be aware of the almost universal uptake of GPS for road vehicle navigation – so much so, in fact, that it might become part of the driving test, according to the Royal Institute of Navigation. While this may help us on the drive to the airfield, the real benefit is that it provides a source of cheap GPS sets. Now all we need to do is convert them to aeronautical use.

Development using small computers and Personal Digital Assistants (PDA) has been going on for some time. These still represented a significant cost and have features that were not required for an airborne use. Some of the car GPS sets are in fact Windows C.E. computers, which can do much more than run a road navigation package. Using this operating system, programs like MemoryMap can be installed. These provide moving map functionality displaying the CAA half and quarter mil charts, as well as AIP Airfield Diagrams. The whole of France is also covered in the same system at half-mil scale.

One significant advantage of using CAA charts displayed digitally is that they are in the same cartographic style as the paper chart on your knee. You don't need to try and remember what colour the GPS manufacturer uses for controlled airspace etc. This in itself might help reduce airspace infringements. Another nice feature of MemoryMap is that as well as displaying the present position, it also displays a vector showing your track and where you will be in ten minutes time if you keep the same heading and speed – ideal for adjusting a heading to get around an obstruction or controlled airspace. A route can be planned on your PC and downloaded to the GPS. It's easy – make a route and rubber band it around places you'd like to avoid, such as the Heathrow Zone. When you get back you can download your track from the GPS to show that you were innocent of any infringements, or alternatively delete the data as quickly as possible!

The real advantage of this system over the dedicated aeronautical units is that it's cheap. I managed to buy a Navigo V2 on the Internet for £60 including shipping, although it may be cheaper elsewhere. The MemoryMap software and map sell for £20 from the usual Pilot Shops. You'll also need an SDMMC card, 2Gb would do nicely, although the Navigo will take up to 4Gb. You may already have some or all of these components, in which case it won't cost you too much.

A full description of installing the software on a GPS will degenerate in to Nerd Speak, so I'll pass on that and direct anyone interested to the "This looks good – Memory Map GPS charts…" thread on the Flyer GA Discussion Forum. (www.flyer.co.uk). There is plenty of help on the internet. I was initially assisted by the good folks on the forum, who pointed me in the right direction. There may be other car GPS sets that will work just as well. The critical thing being that they run the Windows CE operating system.

PDA/GPS systems

I've been playing with various GPS display systems since they first appeared on the market. The initial system used an external GPS, which was connected by wire to the PDA. Some of the first software on the market was from the American company Anywhere Map. Their maps primarily covered the USA, but some European coverage was available. Some people used the Compaq PDA with its own GPS sleeve. The example shown here uses the RS232 connection and NMEA data from any GPS set. Sadly this PDA is so old I couldn't get it to run!

The next technological step was to use Blue Tooth to communicate between the GPS and the PDA. This reduced the clutter of wiring around the cockpit. Another problem with the early PDA was that the electrical connection was rather large and weak. Aircraft vibration didn't help. MemoryMap came on the scene around this time, so scanned digital charts started to be used. Our sailing friends are well ahead of us in this area. They have been using digital charts for some time now.

The next development in the system was to have the GPS built in to the PDA. The Navman PIN is an example of this type. It has resolved the problem of the GPS signal / data connection, but still suffers from the larger

affordable GPS rrr:1 Articles 18/5/09 10:52 Page 35

Above: early PDA/GPS kit – Compaq PDA with RS232 connection and NMEA data from an Etrex
Right: Navman PIN has GPS receiver built in, but needs bulky power connector

power connector.

The Mio 550 is probably one of the best PDA / GPS combinations. The GPS 'engine' or receiver is the latest type, which picks up the satellite signals quickly and can even work reasonably well indoors. Another significant advantage is that the cumbersome power connector has been replaced with a standard mini-USB connection. This means that connections to the computer and to a 12-volt power supply are much easier and more standardised. Being a PDA, the Mio will run forms of Excel, so you can have weight and balance calculations, as well as take off and landing performance to hand. The Mio also has Wi-Fi, so if you can find a friendly signal when down route, you can get the weather, NOTAMS or check your e-mail.

The latest stage of development has been a simplification, getting the moving map functionality on to the cheapest hardware platform available. The Navigo V2 or other Windows CE based GPS looks like providing affordable navigation for all. There are other software packages, including PocketFMS, which run on Windows CE computers.

PocketFMS is good for areas outside the scanned CAA or French charts. It uses vector charts, so allows a 'track up' option, rather than the north up only format of MemoryMap. I must confess to having problems getting PocketFMS to run on the landscape format screen of the Navigo. Anyone fancy a nice little computer project? ■

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